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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
PIERRE LOUIS, ANDRE	
ART UNIT	**PAPER NUMBER**
2123	

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/614,683	CHAPORKAR ET AL.	
	Examiner	Art Unit	
	Andre Pierre-Louis	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 07 July 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-9 have been presented for examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia-Luna-Aceves et al. (USPG-PUB No. 2002/0101869) in view of Liu et al. (U.S. Patent No. 6,744,727).

1.1 In considering the independent claim 1, Garcia-Luna-Aceves et al. substantially teaches a method for designing a network for an Internet Service Provider (ISP) having routers that handle predetermined traffic demands and that are connected by links, and particularly teaches the steps of: (a) obtaining an ordered sequence of (source-destination) pairs of routers (*fig.1 (i&j)*); (b) selecting a particular (source-destination) pair *(pg.1 (0009);* (d) finding the differential cost of the link (*pg.11 (0188*); however, he doesn't teach (c) selecting a minimum capacity for the predicted traffic demands of the selected (source-destination) pair on each potential link; (e) determining the least-cost path for the selected (source-destination) pair (; and (f) updating the current capacity and current cost of the network. But Liu et al. (c) selecting a minimum capacity for the predicted traffic demands of the selected (source-destination) pair on each potential link (*fig. 4, col.8 lines 34-65, also col.15 lines3-10;*

(e) determining the least-cost path for the selected (source-destination) pair (*col.11 lines 47-63, also see col.15 line 16-49*); and (f) updating the current capacity and current cost of the network (*see abstract, also col.15 lines 11-15*). Thus, it would have been obvious to one ordinary skilled in the art at the time of the applicant's invention to combine the teaching of Garcia-Luna-Aceves et al. with Liu et al. for the purpose of obtaining a more efficient low cost system. Liu et al. also teaches the advantage of having the ability to improve utilization *(col.3 lines 56-65).*

1.2 As per claim 2, the combined teachings of Garcia-Luna-Aceves et al. and Liu et al. teach the step (g) of determining if the particular (source-destination) pair selected in step (b) is the last (source-destination) pair in the ordered sequence of (source-destination) pairs *(see fig.2 (207), also col.10 lines 59-61).*

1.3 Regarding claim 3, the combined teachings of Garcia-Luna-Aceves et al. and Liu et al. teach looping back to step (b) to select another particular (source-destination) pair (*fig.2 (208), also see Garcia-Luna-Aceves et al. pg.1 (0013)-pg.2 (0014).*

1.4 As per claim 4, the combined teachings of Garcia-Luna-Aceves et al. and Liu et al. teach the step of determining the least-cost path uses the Bellman-Ford method (*the examiner interprets the Bellman-Ford method to be equivalent to that of the algorithm teach teaches by* Liu *et al.)*; see Liu et al. col.10 lines 1-13).

2.0 Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over (Garcia-Luna-Aceves et al. and Liu et al.), as applied to claim 1-4 above, in view of Groover et al. (U.S. Patent No. 6,654,379).

2.1 With regards to claim 5, Garcia-Luna-Aceves et al. and Liu et al. teach most of the claim limitations; however they do not teach the step of determining the final network design includes using the Link Removal Heuristic (LRH) method. But Groover et al. teaches the step of determining the final network design includes using the Link Removal Heuristic (LRH) method (col.4 line 40-57). It would have obvious to one ordinary skilled in the art at the time of the applicant's invention to combine (Garcia-Luna-Aceves et al. and Liu et al.) teachings with Groover et al. for the purpose of reducing the overall cost of the network. Groover et al further teaches cost reduction using the Heuristic algorithm (*col.12. lines 1-42).*

2.2 As per claim 6, the combined teachings of (Garcia-Luna-Aceves et al. and Liu et al.) and Groover et al. teach the step of determining the final network design includes using the Flow Removal Heuristic (FRH) method (see col.4 lines 57-62). (*Note that examiner interprets the FRH to be equivalent to a path removal).*

3.0 Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Massey (USPG-PUB No. 2001/0026537), in view of Martz et al. (USPG-PUB No. 2002/0143928).

3.0 Regarding claim 7, Massey substantially teaches a fast method for obtaining a low-cost, and possibly least cost, backbone network forming the basic infrastructure of an Internet Service Provider (ISP),

(c) ensuring that a demand between any ingress router and egress router (referred to as an "ingress-egress pair") is not split (*see figure 3*), (d) ensuring symmetric routing of demands between any ingress-egress pair (*see figure 3*), (e)

ensuring hop-constrained routing, viz., that a demand between any ingress-egress pair traverses at most a pre-specified number of hops *(fig. 2, pg.3(0040)-pg.4(0041).* However, he does not teach a) consisting of the routers and the links administered and operated by the ISP--over a given set of router locations, given a traffic demand matrix, the said traffic originating from the demands of the ISP's customers, and a link distance--bandwidth cost matrix, the said cost matrix being given by a bandwidth provider, comprising (b) providing sequential addition of traffic demands, each demand being routed over a minimum weight path, where all possible links given the router locations are considered and the link weights are assigned, for each demand by a differential cost analysis. But, *Maltz et al.* teaches a) consisting of the routers and the links administered and operated by the ISP--over a given set of router locations, given a traffic demand matrix, the said traffic originating from the demands of the ISP's customers, and a link distance--bandwidth cost matrix, the said cost matrix being given by a bandwidth provider *(fig.2 & 3) also pg.3 (0033-0035), also see pg.5 (0045))*, (b) providing sequential addition of traffic demands, each demand being routed over a minimum weight path, where all possible links given the router locations are considered and the link weights are assigned, for each demand by a differential cost analysis *(pg.5(0041-0045)*. Martz et al. further teaches the use of ingress and egress net in matrix representation (see Martz et al. pg.4 (0040). Thus, it would have been obvious to one ordinary skilled in the art at the time of the applicant's invention to combine the teachings of Massey et al. with Martz et al. for the purpose of obtaining a network capable of handle traffic demand at a reasonable cost. Martz et al. further teaches the

advantage of being able to reduce Optical-to-Electrical-to-Optical conversion (pg.1 (0004).

4. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over (Massey and Martz et al.) as applied to claim 7 above, in view of Wong et al. (USPG-PUB No.2003/0193898).

4.1 With regards to claim 8, (Massey and Martz et al.) teaches most of the claim limitation; however they do not teach method includes two additional methods, named Link Removal Heuristic (LRH) and Flow Removal Heuristic (FRH) that reduce cost by further refinements to the network, the said refinements being obtained by the following steps: a) removal of a link (flow) from the network b) updation of the network such that the removal link (flow) can be re-inserted into the network at least incremental cost. But, Wong et al substantially teaches a method includes two additional methods, named Link Removal Heuristic (LRH) and Flow Removal Heuristic (FRH) (*the examiner interpret the SPF algorithm (Wong et al. pg.1 (0003)) to be equivalent to that of the Heuristic algorithm*) that reduce cost by further refinements to the network, the said refinements being obtained by the following steps: a) removal of a link (flow) from the network (*fig.1 & fig.2 (29);* b) updation of the network such that the removal link (flow) can be re-inserted into the network at least incremental cost (fig.1,fig.6 (406)), also pg.1 (0012). Thus it would have been obvious to one ordinary skilled in the art at the time of the applicant's invention to combine the teaching of (Massey et al. and Martz et al.) with Wong et al. for the purpose of reducing the overall cost of the network. Wong et al.

further teaches the advantage of being able to add additional parameters to the link *(pg.2 (0057).*

4.2 As per claim 9, the combined teachings of (Massey and Martz et al.) and Wong et al. teach the method is followed by the Surviving Single Link Failures Heuristic (SSLFH) method which incorporates survivability constraints in the design, by providing alternate paths for connections passing through a failed link, and thereby ensures sufficient spare capacity that is used in the event of single link failures, the said method consisting of a repeated application of the following steps: a. removal of a link from the network (*fig.2 (29),* b. re-routing of all demands that were routed through the above link such that the re-routing can be accomplished at least incremental cost (*Fig.2(24,28), fig6(406), fig.5(308,310,314),see fig. 10 and pg.8 (0200),also pg.7 (0179-0181).*

Conclusion

Claims 1-9 are rejected and this action is non-final. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andre Pierre-Louis whose telephone number is 571-272-8636. The examiner can normally be reached on Mon-Fri, 8am-4: 30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on 571-272-3780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

October 14, 2005

APL

Paul L. Rodriguez 10/14/05

Primary Examiner
Art Unit 2125